Vol. V
No. 8

November, 1924

25 Cents
A Copy

American Cinematographer

Published by the American Society of Cinematographers, Inc.

Communications from Eastman Research Laboratory
By J. I. Crabtree

Eliminate Death from Air Cinematography
By Harry Perry, A. S. C.

PUBLISHED IN HOLLYWOOD CALIFORNIA

Releases

September 28, 1924, to October 26, 1924

TITLE	PHOTOGRAPHED BY
The Bowery Bishop	A G. Heimerl, **member A. S. C.**
The Rose of Paris	Charles Stumar, **member A. S. C.**
Never Say Die	Jack McKenzie
The Clean Heart	Steve Smith, Jr., **member A S. C.**
In Hollywood with Potash and Perlmutter	Arthur Miller and Harry Hollenberger
Poison	Not credited
The Fast Worker	Ben Reynolds
Feet of Clay	Peverell Marley and Archibald Stout
The Painted Lady	Alfred Gosden
Coyote Fangs	William Thornley
Find Your Man	Lee Garmes
The Bandolero	George Peters
The Beauty Prize	John Arnold, **member A. S. C.**
Barbara Frietchie	Henry Sharp, **member A. S. C.**
Not Built for Runnin'	Jake Badaracco
Life's Greatest Game	Paul Perry, **member A. S. C.**
Hearts of Oak	Geo. Schneiderman, **member A. S. C.**
The Western Wallop	Harry Neumann
Biff Bang Buddy	Irving Ries
The City that Never Sleeps	Karl Brown, **member A. S. C.**
The Tenth Woman	John Mescall
The Cyclone Rider	Sid C. Wagner
The Silent Watcher	Norbert F. Brodin, **member A. S. C.**
Fast and Fearless	Irving Ries
Border Women	Not credited
Vanity's Price	Hal Mohr
Dante's Inferno	Joe August
Meddling Women	Frank Zukor
For Woman's Favor	Robert Olson and Marcel Le Picard
The Price of a Party	John F Seitz, **member A. S. C.**
Her Love Story	George Webber
The Pride of Sunshine Alley	Art Reeves

Vol. 5 NOVEMBER, 1924 No. 8

American Cinematographer

FOSTER GOSS, *Editor and Business Manager*
Board of Editors—VICTOR MILNER, H. LYMAN BROENING, KARL BROWN, PHILIP H. WHITMAN

Contents

	Page
HANDLING CINE FILM AT HIGH TEMPERATURES—*By J. I. Crabtree*	4
IMPROVEMENTS IN CINEMA LABORATORY APPARATUS—*By J. I. Crabtree and C. E. Ives*	5
ELIMINATE DEATH FROM AIR CINEMATOGRAPHY—*By Harry Perry, A. S. C.*	8
BOSTON CHAMBER OF COMMERCE PROVIDES FOR FILMS—*By Denny B. Goode*	9
THE EDITORS' CORNER	10
IN CAMERAFORNIA	13
MAKING MOTION PICTURE TITLES, —*(Conclusion)*—*By J. I. Crabtree*	16
A TRIBUTE TO THE CINEMATOGRAPHER—*By Irving A. Eckman*	17
NEW BELL AND HOWELL PROFESSIONAL MODEL OUT	25
A. S. C. ROSTER	27

An educational and instructive publication, espousing progress and art in motion picture photography.
Published monthly by THE AMERICAN SOCIETY OF CINEMATOGRAPHERS, *Inc.*
Subscription terms: United States, $3 00 a year; Canada, $3 50 a year; foreign, $4 00 a year; single copies 25 cents. Advertising rates on application.
1219-20-21-22 Guaranty Building, Hollywood, California Telephone, GRanite 4274
(Copyright, 1924, by the American Society of Cinematographers, Inc.)

Handling Cine Film *at* High Temperatures

Important Formulae Enumerated *and* Research Matter Is Given Out.

By J. I. Crabtree
Eastman Research Laboratory

Difficult Subject Discussed *in* Detail. How *to* Combat Excessive Heat.

Special care is necessary when handling motion picture film at high temperatures when high humidities usually prevail in order t insure that the sensitiveness of the film emulsion shall remain unimpaired before exposure and that the latent image shall be retained after exposure and before development. Special treatment is also necessary if development of the exposed film must be conducted at temperatures above 70°F. while adequate precautions must be taken during storage of the developed film in warm climates, otherwise the keeping qualities of the film will be affected.

¶ *Effect of Temperature and Humidity on Motion Picture Emulsions.*

A. *Unexposed Emulsions.* Although definite data are not available on the effect of temperature on the speed of dry unexposed emulsions, experience has shown that if the temperature of a dry unexposed film is raised, for example, from 65°F. to 100°F., a considerable period of time must elapse before the speed and fog are affected to a sufficent extent to be of practical importance Renwick[1] has investigated the effect of humidity at constant temperature on the speed of motion picture emulsions and states that at a temperature of 65°F. the speed of a film emulsion in equilibrium with an atmosphere whose relative humidity varies between 0 and 80% may vary 50%, depending upon the particular emulsion.

Experience has shown that with unexposed negative film stored in an atmosphere at high relative humidity, say 90%, and at a high temperature, say 90°F. or 100°F., the speed of the emulsion rapidly falls off and the emulsion becomes fogged to an extent depending upon the period of storage.

B. *Exposed Emulsions.* In the case of exposed negative emulsions it is important that the latent image shall remain unimpaired and that the still unexposed portions of the emulsions shall not develop fog. At high temperatures and humidities certain chemical reactions occur in the film which destroy the latent image, and the image is said to "fade," that is, if the film is stored for any length of time the developed image is very much weaker or less dense than if the film was developed immediately after exposure. Apart from this fading of the latent image, under the above conditions of storage, the emulsion becomes fogged with time, which destroys the quality of the developed image. High temperature, however, has a surprisingly small effect on the latent image if the exposed film emulsion is dry, that is, if it is in equilibrium with an atmosphere of low relative humidity. The experience of numerous explorers in tropical countries who thoroughly dried out their film after exposure and before packing but who did not develop the film for several months afterwards thoroughly establishes this fact.

¶ *Effect of a Sudden Change of Temperature on Moist Film.*

If moist film, that is, film which is in equilibrium with an atmosphere of high relative humidity is suddenly cooled, moisture is apt to condense as droplets on the film emulsion which will cause spots on the developed film. Such spots are termed "moisture spots"[2]. There is very little danger of the formation of moisture spots due to sudden cooling of the original unopened film cans. The most frequent cause of moisture spots is sudden cooling of the film when in a moist condition in the camera and retorts.

¶ *The Care of Motion Picture Film Before Exposure.*

From the above discussion it is seen that film must be kept dry and as cool as possible before exposure. The film, however, must not be too dry, otherwise static may be produced in the camera with negative film, and in the printers wth positive film. On leaving the factory, motion picture film as contained in the cans is in equilibrium with an atmosphere having a relative humidity of 70 to 75%, but the paper wrapping absorbs moisture so that the film which is a few months old is relatively dry. The film cans, however, are not perfectly water-tight and in a very moist atmosphere the packed film would absorb moisture very slowly so that it is preferable to pack film which is liable to be exposed to damp atmospheres in hermetically sealed cans. Film packed in this way can be secured on special order from the manufacturers. Five small cans are contained in an outer can with a soldered inside cover and after exposure the film can be repacked in this outer can and again sealed by soldering the outer cover. If the film is liable to be roughly handled it is preferable to construct carrying cases of heavy sheet metal or fibre impregnated with bakelite and fitted with gasketed covers which can be clamped down with suitable screws or clamps. The containers should not be unduly exposed to the sun, and a layer of white felt around the carrying cases serve to insulate the film from sudden heat changes. Positive film in the laboratory should be stored in the original cans at a temperature at as near 65°F. as possible.

Negative films should not be retained for too long a period either in the retorts or in the camera because in a damp atmosphere moisture spots are apt to be produced as explained above. Film should be removed from the original container only as required and in the field a changing bag will eliminate the necessity of carrying an excessive number of charged retorts. If at the end of the day any unexposed film still remains in the camera this, together with the exposed film, should be packed away in cans so that it will not absorb moisture.

¶ *The Care of Motion Picture Film After Exposure and Before Development.*

If any considerable period of time must elapse after the negative film is exposed and before it is developed, the film should be dried out as thoroughly as possible in order to retard the fading of the latent image, and fogging of the emulsion, and to prevent the possible formation of moisture spots as explained above. The film should not be dried to the point where it becomes excessively brittle, otherwise it would be apt to crack or develop static when unrolling previous to development. Two methods of drying the film are possible, as follows:

1 F. W. Renwick, Trans. Soc. M. P. Eng. Vol. 20.
2 "Markings on M. P. Film Produced by Drops of Water," by J. I. Crabtree and G. E. Matthews, Trans. Soc. M. P. Eng. Vol. 17, 29.

(Continued on Page 20)

Improvements *in* Cinema Laboratory Apparatus

From Transactions, Society *of* Motion Picture Engineers.

By J. I. Crabtree and C. E. Ives
Eastman Research Laboratory

Title Making, Film Viewing *and* Other Devices Are Described.

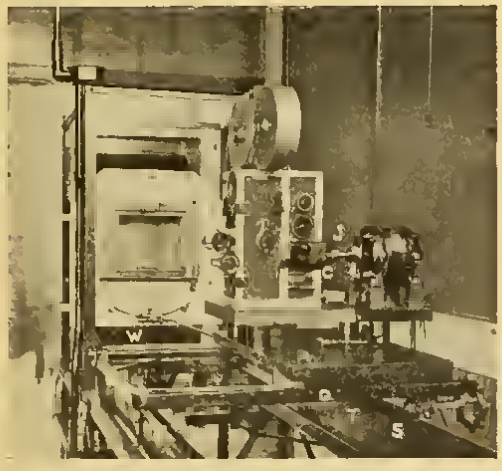


Fig. 1. Title Making Apparatus

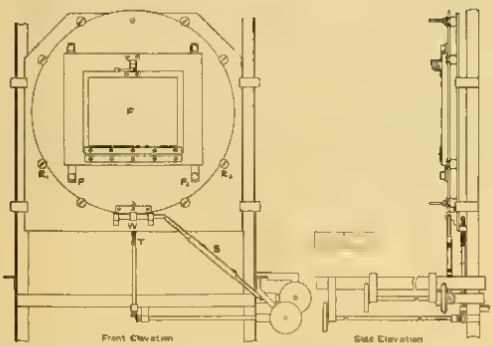


Fig 2 Adjustable Title Card Holder

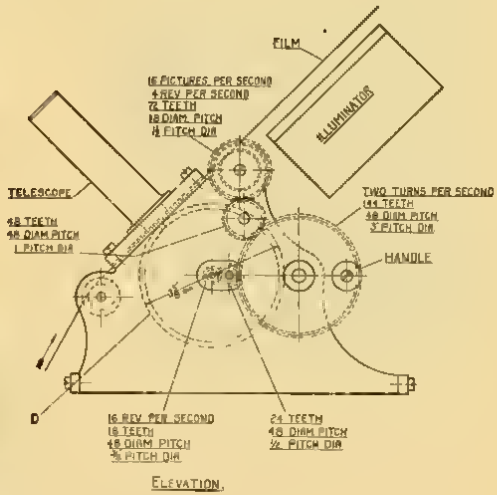


Fig 3. Viewing Machine

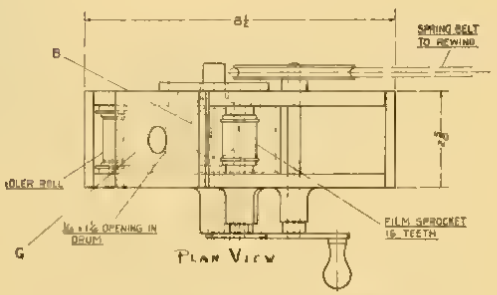


Fig 4. Viewing Machine

In this paper is presented a description of the following apparatus in use in the Film Department of the Research Laboratory of the Eastman Kodak Company:

1. An Apparatus for Making Motion Picture Titles.
2. Continuous Film Viewing Machine.
3. Semi-Automatic Sensitometer.
4. Safety Devices.

1. Apparatus for Making Motion Picture Titles

When this apparatus was designed it was required to take care of title cards of varying sizes so that it was necessary to be able to vary the distance between the camera and title card holder from two to six feet. In choosing between a horizontal and vertical arrangement of camera and easel the vertical arrangement has many advantages when photographing title cards of uniform size, but in order to be able to vary the distance between the camera and title card it would be necessary to move either the camera or easel against gravity so that the horizontal arrangement was finally adopted.

A second problem in design, was whether to incorporate all adjustments in the easel, the camera remaining stationary; or to construct a fixed easel nad incorporate all adjustments in the camera supports, or to make both camera and easel adjustable. It was finally decided to make the easel adjustable in a vertical direction, to rotate the title card holder, and to secure side adjustment by moving the camera. In view of the difficulty of preventing vibration of the camera, it is considered that it would be preferable in future designs to secure side adjustment by moving the title card holder and not the camera.

Eliminate Death *from* Air Cinematography

Daredevil Stunts Accused *of* Being Trick Work When Viewed *by* Audience.

By Harry Perry, A. S. C.

Special Effects Would Get Same Results *and* Forestall Loss *of* Human Life.

(Harry Perry, A. S. C., the author of the following article, speaks with authority on the matter of photographing motion picture action and "stunts" in the air, he having turned his camera in an aeroplane for such productions as B. P. Schulberg's "The Broken Wing," "The White Man", Universal's "The Fighting American," Ruth Roland's recent feature, in addition to having done similar work for industrial assignments.—Editor's Note.)

This is an article setting forth the writer's personal views regarding the big opportunity there is for every cinematographer to help save lives. This sounds like a queer sort of statement, but the reason for it is that every so often we read a small article in the paper about some stunt man or woman being killed or injured in attempting to carry out some thrilling action during the taking of stunt scenes.

Tragedies

A few days ago, a man lost his footing on the ladder attached to an aeroplane and fell 500 feet to death. Another man was lost attempting to swim some rapids in the Colorado River. Locklear, the aviator, lost his life in an aeroplane stunt. Pichens, another stunt man, lost his life in a ladder mishap on a plane.

These are just a few instances, there having been many more—and my reason for bringing them up is that nearly all these stunts could be done, in my opinion, with more realism, with less expense and with no chance of accident, by means of good miniatures and trick camera work.

Not Believed Real

Many of the stunts in pictures are not believed to be the real thing by the picture patrons anyway, especially the most difficult ones. For example, several months ago, I photographed a stunt man 3000 feet in the air being knocked off the wing of a second plane by another man, and then swinging head down from the end of the wing underneath the landing gear, and thence coming up on the opposite wing of plane (after swinging like a pendulum on a clock) where he caught hold and pulled himself on to the wing.

Dare-devil Stunt

He was secured by heavy wires attached to his ankles which extended to the landing gear of plane. Everyone who saw the picture and did not know that the stunt was actually photographed, *said it was a pretty good trick, so what is the use of a man's risking his life to do a stunt which is not even believed and which could be done just as well in miniature?*

I do not contend that all miniatures are good, or even a part of them, but I do think that there is a big chance for improvement in them and that the opportunities are unlimited for cinematographers in this line, insofar as aerial cinematography is concerned.

The A. S. C. gasoline alley has been further enriched by H. Lyman Broening's Chrysler Sedan, Frank B. Good's sport Chandler, L. Guy Wilky's sport Chandler roadster, George Meehan's Wills-St. Claire, James C. Van Tree's Buick sedan, the Ford which Victor Milner carries as an auxilliary to his Hudson coach, Gilbert Warrenton's best Ford coupe in the world, George Barnes' Ford coupe for California use, etc.

Will Robert Kurrle, Fred Jackman and Perry Evans kindly form a three-legged quartet and sing praise why the Marmon is the best car in the world?

VISUAL EDUCATION

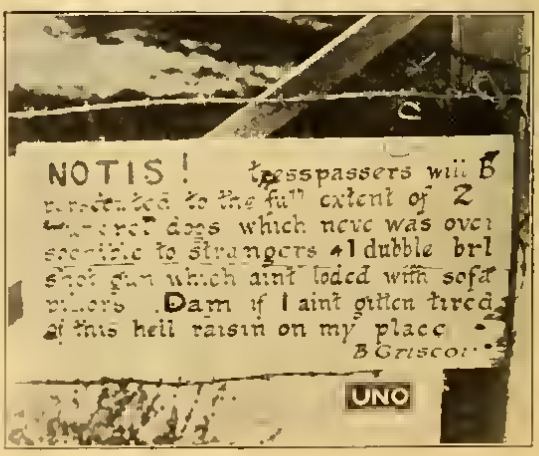


Photo by International Kinema Research

Boston C. *of* C. Provides *for* Motion Pictures

Great Portion of Recently Completed Building Reserved *for* Motion Pictures.

By Denny B. Goode

Architecture Designed *to* Take Care *of* Chamber's Cinema Requirements.

No part of the Boston Chamber of Commerce equipment, when it moved into its new $6,000,000 building in October, was more generally admired than its spectacular lighting effects and the elaborate provision that has been made for the projection of moving pictures. Careful thought has been given, for more than a year before the building was completed, to the projection of moving pictures and the growing popularity of pictures was recognized almost in every feature of the great assembly hall on the fourteenth, which is the top floor, of the new building.

Shut Out Light

The five great chandeliers in this room are so hung that the light projected by the moving picture machine passes between the four corner ones and beneath the central one. Curtains were built into the windows so that when they are drawn the light is shut out completely from the outside. The screen itself is folded up and down and when not in use, it is cleverly concealed by an ornamental design.

A large amount of space was consumed in the rear of the room for the installation of a great theatrical organ and in order to retain the symmetry of proportions as well as to utilize all waste spaces, a balcony was built in the central part of the back of the room and in the rear of this, the moving picture projection room with moving picture machines and stereoptican machine was constructed. Alongside the projection room was installed a loud speaker system which enables a speech delivered in the assembly hall to be received over a metallic circuit in any of the seventeen private dining-rooms on the floor or in the cafeteria in the basement, fifteen floors below. Special provision has been made in the installation of the loud speaker system to connect it up with radio reception so that a speech delivered a thousand miles distant from Boston may be received in any of dozens of rooms, as may be desired. Organ recitals, which were given during the opening week were likewise received, at the will of the operator, in any of the public rooms of the building.

The locations of the organ, the loud speaker system, and the projection room, are so conveniently arranged that they can be made to syncronize with each other. One of the organ recitals during the opening week, included an imitation of thunder. The lighting equipment in the building was perfectly installed and the imitation of actual lightning was entirely realistic.

Colored Lights

A series of colored lights, generally concealed in the ceiling, give many spectacular effects. Indeed, the experiences of the opening week were so favorable that the General Electric Company has now made arrangements, in connection with the forthcoming electrical convention to be held in Boston, to experiment with the room and to attempt to get all the spectacular and theatrical effects that can be had and to blaze new trails along the lines of electric lighting.

The resident membership of the Boston Chamber of Commerce is limited to 7500 and the New England membership, outside of metropolitan Boston, is limited to 2500. It is estimated that more than half the total membership of the Chamber visited its new quarters during the ceremonies attending the opening, which included daily luncheons and dinners. Plans have been made for visitors in Boston to inspect the building and visit the quarters during business hours.

New Film Profession? Or New Name *for the* Cinematographer

Possibly syndicate material, the following item appeared recently on the editorial page of a Los Angeles newspaper:

The greatest skill and the greatest ingenuity of many branches of science have been used and developed in the movies.

A new profession has arisen as a result; it is that of the "movie engineer." He directs the erection of the huge structures, constructs miniatures scenes in the laboratory and performs all sorts of wonders, through photography, with toy-sized objects and landscapes.

Accurate information concerning the motion picture professions is to be desired but misinformation, no matter what the intent of the writer, is worse than no information at all. As far as this publication knows there is no film calling which may be specifically labelled as "movie engineer," embracing the activities enumerated in the foregoing article. There is, of course, the Society of Motion Picture Engineers but membership in that society is not concentrated on any one particular film calling—such as the "movie engineer"—but reaches into the various branches of the industry.

Needless to say, numerous of the duties attributed to the "movie engineer" are those of the cinematographer himself.

REMEMBER

The American Society of Cinematographers was unable to obtain, for its new headquarters, the telephone number (HOllywood 4404) that it held for the past several years.

The new number, don't forget, is

GRanite 4274

The Editors' Lens - - - - *focused by* FOSTER GOSS

Higgin Is Right!

¶ Speaking at a meeting arranged by George Landy recently for the Western Motion Picture Advertisers (the "Wampas"), Howard Higgin, noted scenario writer, expressed, in detail, the view that the time had come for motion picture publicity to be broadened so as to include not only the stars and players themselves but to give attention to the other artists who, though they are never seen, are indispensible factors in the production of every picture.

¶ Higgin indicated that the general concentration on the players in matters of publicity had made the reading public so familiar with their lives that the slightest adverse happening in their affairs conjured a boomerang that redounded to the detriment of not only the publicized principals, but to that of the industry as a whole.

¶ Higgin gave it as his opinion that the time had come to move away from this extreme in publicity. He believes that by giving the director generally, the scenarist, the art director, the cinematographer and all those whose efforts go to make up a motion picture, the attention that their merits deserve in publicizing—that by so doing, a substantial or business-like, if you please, form of publicity will be created which will not only make good reading and result in bestowing credit where such is due, but which will remove film publicity from the realm of the frivolous and place it on a foundation which, being diversified, is not susceptible to casting out boomerangs.

¶ That such a program of publicity can be highly beneficial has been proved to those publicity men who have transcended the beaten paths. They can testify that Higgin is right. Leading publicity men realize this, as shown in the article of Harry D. Wilson, president of the "Wampas," in last month's issue of this publication. Incidentally, Wilson's article points out conclusively where the cinematographer fits in under Higgin's plan.

Squelch the Charlatans

¶ Reports from the East tell of the bringing together in New York City, as the result of arrangements conducted by the Hays organization, of representatives of the Investment Bankers Association, the Better Business Bureau, the New York Credit Men's Association, the National Association of Credit Men, the National Vigilance Committee and the American Bankers Association, for the purpose of effecting national co-operation against the activities of fake film promoters. It is said that the representatives of these organizations pledged their support in this direction.

¶ The necessity for such action cannot be overlooked. As has already been mentioned, the *American Cinematographer* realized the urgency for halting these gross and petty practices when it was the first to specifically and directly oppose the shady promoters by virtue of its expose of "The Independent Motion Picture Producing Company" in Dayton, Ohio, more than a year ago.

¶ The work of the Hays organization against the betrayers of films deserves the support of all within the industry. This publication is glad to see the national organized co-operation. It should not be possible for the fake promoter to ply his trade even in the remotest settlement.

Prosperity at the Box Office

¶ Now that the election is over, let's hope, no matter what our political faiths may be, that the next four years will be abundantly prosperous, for such would mean prosperity for the exhibitors—which in turn would work for prosperity among those who make the pictures.

¶ The token of the full dinner pail makes itself felt at the box-office, for, inversely, citizens who are affected by economic depressions, draw in on the dimes that they spend for amusements.

PHILIP H. WHITMAN, A.S.C.

Manhattan Mutterings

By PHILIP H. WHITMAN, A. S. C.

¶Being mumblings heard by an A. S. C. member in rumbling and rambling about old New York town.

Pronounced Great Work

¶Pronounced by all authorities on the subject as the greatest piece of trick work in years, Bucky Harris and his plucky Washington Senators achieved the remarkable fade-out of John McGraw and his New York Giants in the last reel of the recent world's series. While this trick work comes in for special commendation, the exposures must not be overlooked, consisting as they did of any number of singles, doubles and even quadruples. All of us cinematogs who were present (our grand and great grandmothers having all passed out as alibis), were unanimous in our praise and all agreed there was no room for re-takes.

All joking aside, it was some world's series and never before have our cinematographic efforts been so badly interrupted by any outside influence. But now to work again.

Rosher Returns

¶With the arrival of the S. S. Mauretania last week came our old friend and fellow A. S. C., Charles Rosher, who has spent the last six months abroad studying foreign conditions and incidentally getting some artistic title backgrounds for forthcoming Mary Pickford productions.

Charlie, who is leaving any day now for the west coast, reports considerable production activity over-seas, particularly in Germany. He has gathered much authentic data which he hopes to have time to assemble in a story, so that it may appear in an early issue of the *American Cinematographer*.

Seitz Sails

¶With the departure of the French liner, *Paris*, last week went John Seitz, A. S. C., and the entire Rex Ingram production unit. They are headed for Paris, where work on Mr. Ingram's new picture, "Mare Nostrum," is scheduled to start soon. The entire production will be filmed abroad and studios at both Paris and Nice are to be used. It is understood

(Continued on page 15)

Bert Glennon, A. S. C., is photographing "Tomorrow's Love," a Famous Players-Lasky production, directed by Paul Bern. Agnes Ayers and Pat O'Malley are starred.

* * *

Reginald Lyons, A. S. C., has finished the Fox production, "The Arizona Romeo," starring Buck Jones and directed by Ed Mortimer. Reggie will have time now to get his Packard racer in shape for the 250-mile road race at Ascot Thanksgiving day. Reggie is installing four-wheel brakes and new springs and pistons. Reggie says he is out for the "big dough."

* * *

Paul P. Perry, A. S. C., is completing the photography on Douglas MacLean's latest production at the F. B. O. studios.

* * *

E. Burton Steene, A. S. C., who customarily holds forth in New York City, has deserted the metropolis for the time being on a combined business and pleasure trip to Hollywood. Steene is renewing many old acquaintances made in the hectic days when pictures were "in their infancy" in Gotham and when every cameraman had to pack a strong arm as well as a cranking arm for application against the detectives who were bent on demolishing the cameras that weren't being operated in the interest of the old film trusts.

* * *

Fred and Floyd Jackman, both A. S. C. members, are in the wilds of Arizona on location for the filming of the latest Fred Jackman productions for Hal Roach studios. The A. S. C. members have set out to make their wilderness camp as modern as conditions will permit. The paraphernalia includes a projection machine for the exhibition of pictures taken on the location, and a generating system which will give the Jackman camp electric lights.

* * *

Victor Milner, A. S. C., is photographing the Famous Players-Lasky production, "East of Suez," starring Pola Negri and directed by R. A. Walsh.

* * *

E. B. Du Par, A. S. C., has returned from Sacramento and for the past several days has been doing special work at the Warner Brothers studio in Hollywood.

* * *

Al Gilks, A. S. C., is still busy with the cinematography on Paramount's "North of 36," which promises to be one of the outstanding releases of the season.

* * *

Bert Glennon, A. S. C., has been appointed to the A. S. C. Board of Governors pro tem. during the absence from Los Angeles of John F. Seitz, A. S. C.

Hans Koenekamp, A. S. C., has similarly been appointed in the place of James Van Trees, A. S. C., who is in New York City with First National productions. Seitz has sailed for Europe where he will film Rex Ingram's latest production.

Walter Lundin, A. S. C., will have his camera efforts go out under the Paramount banner henceforth as the result of the arrangements whereby Harold Lloyd's productions will be released by Famous Players-Lasky.

* * *

Sol Polito, A. S. C., has been spending busy days on the filming of "A Cafe in Cairo," a Hunt Stromberg production starring Priscilla Dean.

* * *

Ned Van Buren, A. S. C., has returned to Los Angeles from New York City.

* * *

Gilbert Warrenton, A. S. C., has returned from a location trip of several weeks at Victorville, Calif., where he finished the cinematography on his latest production for Universal.

* * *

Photographed by L. Guy Wilky, A. S. C., "The Fast Set," William de Mille's current Paramount production, was given its premiere in Los Angeles recently.

Harold M. Bennett Announces New Carl Zeiss Tessar Lens

Harold M. Bennett, photographic agent of New York City, has announced a new Carl Zeiss lens—the f:2.7 Tessar.

Bennett states that he anticipates a heavy demand for the new equipment. Advance orders are already being received and are being booked in the order of their arrival.

Elaborate Biblical Scenes *to* Be Made *in* Color *for* Metro Production

Production on "So This Is Marriage" was suspended for three days at the Metro-Goldwyn-Mayer studio to allow Hobert Henley and his staff of assistants to prepare for the filming of the elaborate biblical sequence for this picture.

From Bible

The episode that embraces these mammoth scenes is a biblical insert into the modern story of "So This Is Marriage." It will be photographed in natural colors by the technicolor process. The story of this dramatic and spectacular sequence is a faithful adaptation of the eleventh and twelfth chapters of Samuel, which relates the familiar tale of the David, Uriah and Bath-Sheba triangle.

Special Costuming

More than five hundred people are to be used in the biblical scenes. Among these are fifty dancers who are being trained by Mlle. Fanchon. The costuming, by Sophie Wachner, is to be especially pictorial and vivid as the colors will show on the screen as they appear to the eye.

From studio to screen—

EASTMAN FILM

Just as in the studio where Eastman *Negative* Film makes the most of the cameraman's skill, so in the theatre Eastman *Positive* Film carries quality through to the screen.

Look for the identification "Eastman" "Kodak" in the film margin.

EASTMAN KODAK COMPANY
ROCHESTER, N. Y.

MANHATTAN MUTTERINGS

(Continued from page 12)

the company will be in Europe for several months.

New Units at Famous

¶ Sydney Olcott is preparing to start any day now on the production, "Salome of the Tenements," which he is to do for Famous Players-Lasky. Al Liguori will be in charge of the cinematographic end of the picture.

Tommy Meighan's next starring vehicle is to be directed by Eddie Sutherland, who is busy at present on the final revision of the script. Faxon Dean, A. S. C., who recently arrived from the coast to photograph Tommy Meighan, will in all probability be at the camera.

Dwan Also

¶ Allan Dwan, who has just finished the direction of Bebe Daniels in "Argentine Love" for Famous Players-Lasky, is leaving soon for Paris where he will film the exteriors for Gloria Swanson's next picture.

New Photographic Wrinkle *for* Use *in* "The Great Divide"

A cinematographic treat is being prepared by Percy Hilburn in the filming of "The Great Divide," the screen version of William Vaughn Moody's great Arizona romance which Reginald Barker is directing for Metro-Mayer, and of which Percy Hilburn is chief cameraman.

Mr. Hilburn has done a great deal of experimenting and during the making of "The Great Divide" he has been making an additional "shot" of each scene; during the filming of this special "shot" he uses a new lighting effect, the principle of which revolves around the use of colored light. So far the results, it is stated, have more than justified the time devoted to the special work on these interior scenes.

Georges Rizard, A. S. C., who has photographed some of the screen's outstanding productions the latest of which was "The Courtship of Miles Standish," has left Los Angeles on a jaunt to New York City.

Put *yourself* on your Christmas list

YOU can give to yourself at Christmas time, and yet be as unselfish and as charitable as you like to be. Buy Christmas Seals

Everywhere there are men and women whose only hope for life and health is in the Tuberculosis Associations. Christmas Seals furnish the funds to bring these men and women sufferers from tuberculosis back to health. When you buy Christmas Seals, it is *you* who are giving them the greatest gift that lies within the reach of man—the gift of life.

Every life you save from tuberculosis means additional protection for you and your family. Funds from the sale of Christmas Seals have eliminated half the deaths from tuberculosis.

Help stamp out the dread disease Buy Christmas Seals

STAMP OUT TUBERCULOSIS WITH CHRISTMAS SEALS

THE NATIONAL, STATE, AND LOCAL TUBERCULOSIS ASSOCIATIONS OF THE UNITED STATES

Making Motion Picture Titles

By J. I. Crabtree
Eastman Research Laboratory

From Transactions
Society of Motion
Picture Engineers

(Continued from last month)

Only the best cameras should be employed. Dowelling pins are indispensable in order to insure registration in double exposure work. The gate tension should be adjusted so as to accommodate the thinner positive stock, while reflections from the usual strip of steel on the pressure plate in the gate which often cause a dark line through the center of the film should be prevented by replacing the steel with a strip of ebony. The frame line should be capable of adjustment through a distance of one full pitch in order that titles may be matched to negatives which do not have the standard frame line midway between perforations. The gate aperture should be made considerably larger than the standard projector gate in order to prevent the possibility of a border showing on projection.

A series of lenses of 2, 3, and 4½ inches focal length fitted in focussing mounts is desirable. The camera should be motor driven and fitted with a reversing switch and counter for making dissolves.

The Lens Hood

A lens hood is an essential camera accessory if maximum photographic contrast is required. The hood functions by eliminating flare due to extraneous light. An ideal lens hood is one having a rectangular aperture, the length of the sides of the aperture having a ratio of 4:3, which is the ratio of length to the breadth of the camera gate. If the lens were a pin hole then the aperture of the lens hood would be in focus no matter what its distance was from the lens, but in the case of an ordinary lens, unless the aperture is placed at a considerable distance in front of the lens when the latter is focussed at infinity, the image of the aperture is not sharp; that is, there is a vignetting effect at the gate. It is obvious that the aperturs of the lens hood should be sufficiently large so as not to vignette, but the greater the extent of the vignetting the greater the size of the aperture must be over and above that required for an ideal lens (a pin hole), although the efficiency of the lens hood is then proportionately less. For a circular lens hood the following formula gives the relation between the diameter and the length.

$$\text{Diameter of Hood} = \frac{5}{4} \times \frac{\text{Length of Hood}}{\text{Focal Length of Lens}} + \text{Aperture of Lens.}$$

The width of the lens aperture is found by dividing the focal length of the F number of the lens; that is, for a 2″ lens working at f|4 the width of the aperture is one-half inch.

As an example, to find the width of a hood 8″ long for a lens having a focal length of 2″ and working at f|4,

$$\text{Width of hood} = \frac{5}{4} \times \frac{8}{2} + \frac{1}{2} = 5\tfrac{1}{2}''.$$

This gives a cylindrical hood 5½″ in diameter having a length of 8″, which should be fitted with a rectangular opening as large as possible.

The same result could, of course, have been obtained by trial and error, by viewing the gate image while varying the hood aperture and observing when a vignetting occurred.

Since the longest hood is the most efficient, the most satisfactory hood for title work consists of a black mask having a rectangular opening (ratio of sides 4x3) placed between the illuminating lamps and the camera. The opening may be made adjustable by means of suitable sliding shutters in case different sized title cards of different lenses are used. The correct size of the opening may be found either by trial and error or by calculation as above.

The Lighting Equipment

Of the three available light sources; namely, arc, nitrogen tungsten, and mercury vapor, the latter is to be preferred on account of the greater photographic actinic power of the radiation, its adaptability for uniformly illuminating large areas, and the fact that the intensity fluctuation with voltage is not of the same high order as with tungsten lamps. The "M" type of mercury tube is to be preferred, while there is little to choose between lamps for AC and DC current. For making titles by transmitted light a sheet of opal glass arranged in a frame in front of the "M" tube lamp constitutes a very uniform source of illumination.

Choice of Film Emulsions

Since positive film emulsion is capable of giving greater contrast than negative emulsions, positive film is usually employed for making every type of title, both direct and indirect, although when making the negative for indirect titles sufficient contrast may be secured on negative film, which has the additional advantage that it does not have as great a propensity as positive films to attract dust in the printer.

Exposure and Development

With a constant light source at a constant distance from the title card, the exposure is controlled by the speed of taking and the lens aperture. A speed of 8-16 pictures per second is usually employed but it is desirable to work at the smallest possible lens aperture in order to increase definition. For a given development the exposure should be so adjusted that no spreading of the letters in the case of negative titles or "filling-in" in the case of positive titles occurs. It is customary to fully develop titles in a contrast developer, but care should be taken not to exceed the fogging point. The fogging point of the developer is determined by developing unexposed strips of film for increasing times and noticing the time of development at which fog just commences to appear. If a developer fogs in, say, 10 minutes, a safe time of development is 8 minutes providing the developer does not give stain. A suitable developer formula for titles is as follows:

	Metric	*Avoirdupois*
Elon	1.0 gms.	7 ozs.
Sodium sulphite (desiccated)	75.0 "	31 lbs.
Hydroquinone	9.0 "	4 "
Potassium carbonate "	25.0 "	10 "
Potassium bromide "	5.0 "	2¼ "
Water to make	1 liter	50 gal.

The average time of development is 7 minutes at 65 degrees F.

(Continued on Page 17)

A Tribute to the Cinematographer

Part Camera Artist Plays *in* Making *of* Big Productions Is Accorded Praise

By Irving A. Eckman

(Note—Though this article is written by a cinematographer it serves to present the view of a student among the laymen as Mr Eckman writes as one who is far removed from the film capital yet as one who is engaged in the camera calling, his perspective being attained from St Louis Mo., where he is cinematographer for the General Film Manufacturing Company)

In the motion picture business, prominent among the nation's greatest industries, there is found a co-ordination of effort that is unique to the uninitiated. Here industry and art are brought together to give their combined resources to the peoples of the world.

However, the interest of the motion picture theatre public regarding the commercial side of motion pictures is centered chiefly in how much salary their favorite star makes per week. The various magazines of filmdom occasionally give them some news of the cost of some particular play. United States Government statistics show them how much they pay in a year for admissions. But this knowledge is acquired voluntarily—consciously.

Unconsciously—involuntarily, though, a greater knowledge is brought home to the picture patron. Through the medium of the motion picture a new art has had its birth. A new art?—perhaps—but yet it embodies all the age-old arts within it. It is this composite art that involuntarily finds a response within ourselves. It is this art that makes us laugh with the comedian, urge on the hero, cry with the heroine. It is this art that makes us thrill at the sight of our country's resources spread out before us in the educational film, marvel at the rhythmical motions of a race horse seen with "slow motion" in the news reel, the art that makes us realize how small we are when we see Nature's forces portrayed in the scientific film. All these things, and a host of others are brought to the screen through the art of cinematography—*motion photography*.

The single eye of the camera—the lens—records on the sensitive film particles matter which the two human eyes will fail to perceive. The motion picture camera is a wonderful instrument, a mechanism that can and is accomplishing great good throughout the world. But not mechanism only is responsible for the advancement of the motion picture and photographic art. The human element is to be considered. A fine instrument put into careless hands, impelled by no motives other than for financial gain, can accomplish little of lasting value in this scheme of life. But a fine instrument in the hands of a skilled operator—an artist, if you will—can record for all time much that can benefit mankind.

The real cameraman—cinematographer—is more than a mere "crank-turner." He must be an artist. He does not compose his pictures on canvas, but upon a narrow strip of celluloid film, and when the pictures are projected on the screen, magnified many times, a critical audience is ever ready to find some faults. So he must be very careful in his work.

The news cinematographer records the events of the world and shows us how our neighbors live. His pictures can be true to actuality and artistically photographed, or carelessly done, thus unconsciously telling an untruth to the spectator. He works alone and his ideas are those we see on the screen. But a vast majority of cinematographers are engaged in another way to express ideas on the screen. Their ideas are interwoven with the stories of the photoplays which constitute the bulk of motion pictures being produced.

In the production of feature photoplays the director must rely to a large extent on the cinematographer for the proper interpretation of his ideas on the screen. Therefore, there must needs exist the closest co-ordination between these two artists. That it does exist goes without saying, as we can see from any of the big feature successes in motion picture history.

(Continued from Page 16)

Contrast of Titles

The limiting contrast obtainable, which is measured by the background density providing the lettering remains perfectly clear is determined by the tendency of the letters to become veiled over or fogged, and the extent of the side spreading of the image which is manifested by broadening of the letters in the case of negative titles and "filling-in" of the letters with positive titles.

A simple method of testing title images is to press the film emulsion face down on to a sheet of white paper. By comparison with a title of good quality any trace of fogging or image is readily discernible.

Veiling of the lettering may be a result of the following causes:

1. Chemical fog due to over-development.
2. Light fog caused by reflection from points outside the title card area. This may be eliminated by blackening the board to which the title card is attached and by the use of a lens hood (see above).

Spreading of the image may be a result of:

1. Irradiation in the film emulsion or reflection of light from the small crystals of silver halide composing the emulsion. In the case of positive film the extent of this negligible.
2. Aberrations in the lens system which limit the ability of wide aperture lenses to resolve fine detail. By stopping down the lens or a wide aperture lens stopped down spreading of the image is minimized.

Lens aberrations are also of lower magnitude when violet light is used, which is another argument in favor of mercury vapor illumination for title work.

As a result of experiments to determine whether the degree of spreading of the image for a given background density was greater when giving a minimum exposure and developing to the limit or when developing for a shorter time and giving an increased exposure so as to secure the same background density, no difference in the "filling-in" of the letters was observed. Nothing is to be gained, therefore, by developing to the fogging point. As explained above it is best never to approach the fogging point within two or three minutes.

II. Illustrated Background Titles

An illustrated title consists of lettering superimposed on a picture background which must be in low key so as not to distract the eye from the lettering. The background may be made from an artist's drawing, an enlargement from a single picture frame of the motion picture, or by photographing an actual setting. The procedure for making such titles may be outlined as follows:

1. *Illustrated Titles by Reflected Light*
   A. Direct Titles

Use a negative drawing or photograph of background with superimposed lettering.

B. Indirect Titles

Make a double exposure first with a positive drawing or photograph and then with a white lettered title on a black ground.

2. *Illustrated Titles by Transmitted Light*

A. Direct Titles

Use film negative of subject in contact with a second clear film with printed lettering.

B. Indirect Titles

Make a positive transparency from 2-A by contact printing and then copy with the title camera or make both positive and final negative in the title camera.

The photographic quality of the background image is of great importance if a low key effect is to be obtained in the final positive with normal development. It should be fully exposed and very much underdeveloped. When making illustrated titles by transmitted light an idea of the density of the transparency image at the various stages of the process is given in the following table:

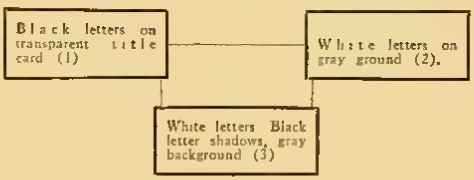
Nature of Film	*Average Maximum Density*	*Degree of Development*
Background Negative	0.7 to 0.9	1 min. No. 16 dev * 65°F.
Camera Exposure (positive)	1.1	Fully developed
Negative	0.9	2 min. No. 16 dev. 65°F.
Final Positive	2.0	5 min. No. 16 dev. 65°F.

III. Relief Titles

An appearance of relief may be imparted to the letters of a motion picture title by adopting the method employed by sign writers, namely: edging the clear letters with a narrow line having a greater density than the surrounding background so as to give the effect of a shadow which in turn produces a relief effect. The method of producing the relief effect when making direct and indirect titles by reflected or transmitted light may be outlined as follows:

1. *By Reflected Light*

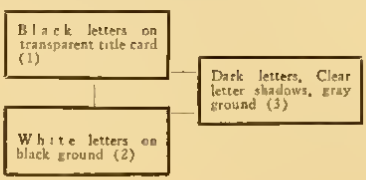
A. Direct Titles


Black letters on transparent title card (1)
White letters on gray ground (2).
White letters Black letter shadows, gray background (3)

Superimpose No. 1 and No. 2 slightly out-of-register and copy with title camera.

B. Indirect Titles

Make negative from No. 3 above or


Black letters on transparent title card (1)
Dark letters, Clear letter shadows, gray ground (3)
White letters on black ground (2)

First expose card No. 1, then make a double exposure with card No. 2 slightly out-of-register.

* Manufacturers' recommended developer for Eastman Positive

Roy Davidge Film Laboratories

NOW LOCATED AT

6701 Santa Monica Blvd.

(Opposite Brulatour's)

GREATLY INCREASED FACILITIES

NEW EQUIPMENT

COMPLETE COMMERCIAL PROJECTION ROOM

PHONE GRanite 9503

FOR SALE

Pathe No. 1110, completely equipped with six magazines, tripod, tilt head, mats and vignettes of every description. Guaranteed in perfect shape. 40, 50 and 85 mm. lenses. Bargain.

JAMES C. VAN TREES
American Society of Cinematographers

SCHEIBE'S PHOTO-FILTER SPECIALTIES

Are now popular from coast to coast, and in some foreign countries.

If my many varieties do not always fill the bill, tell me your wants and I will make them on special order.

Always at your service.

GEO. H. SCHEIBE
1636 Lemoyne St. DUnkirk 4975 Los Angeles, Cal.

WALTER J. VAN ROSSEM
6049 Hollywood Blvd.
Phone Holly 725
COMMERCIAL PHOTOGRAPHY
Still Developing and Printing
Bell & Howell Cameras—FOR RENT—Still Cameras

FOR SALE

BELL & HOWELL OUTFIT
Camera, Tripods, Improved Thalhammer Iris, Six Magazines, 40 mm., 50 mm., 75 mm. and 110 mm. Lenses, also Verito 75 mm., Carrying Cases and Trunk.

Outfitted to Satisfy the Most Exacting

Right price and right terms to right party.

Call J. A. Dubray, 5448 Virginia Ave.
Phone 433-305
Los Angeles

THE EXTRAVAGANCE OF
CHEAPNESS

CRITICAL SELECTION

The conscientious producer whose pictures are marked by excellent photography is always critical in his selection of the CAMERAMAN!! Experience has taught him that false economy in this portion of his production budget is sheer

EXTRAVAGANCE

The conscientious photographer whose pictures are a credit to him and to his profession is equally critical in his selection of the LABORATORY.

CHEAPNESS

in the laboratory reflects cheapness in the negative and prints—

CRITICAL SELECTION IS NOT EXTRAVAGANCE

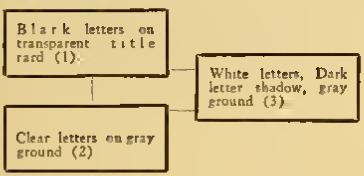
The Memory of Quality Remains
Long After Price is Forgotten

ROTHACKER-ALLER LABORATORIES, Inc.

5515 Melrose Ave. HOLLYWOOD, CALIFORNIA HOllywood 7180

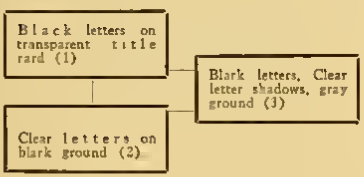
2. *By Transmitted Light*

A. Direct Titles



Superimpose No. 1 on No. 2 out-of-register and copy the composite title.

B. Indirect Titles


Black letters on transparent title rard (1)
Blark letters, Clear letter shadows, gray ground (3)
Clear letters on blark ground (2)

First expose No. 1, then make a double exposure with No. 2 slightly out-of register.

Illustrated relief titles may be made in a similar manner, though the background image should be of low contrast throughout the various steps of the process in order to permit of normal development of the final print.

IV. Scroll Titles

When the quantity of reading matter in a title is too great to be accommodated in one picture frame a scroll is often made. When viewed on the screen the lines of a scroll move in a vertical direction either continuously or intermittently The effect is secured by printing the lettering on a long sheet and stretching the sheet between two rollers attached to the easel of the title apparatus The scroll is then wound on one of the rollers either continuously or intermittently during cranking of the camera. Short scrolls are made by printing on an elongated card arranged between guides on the title card holder and moving the card by hand during the exposure.

V. Animated Titles

Titles in which the letters appear one by one and similar animated effects are made in the same manner as animated cartoons*.

The various methods of securing trick effects are also frequently applicable in making special titles, but this is beyond the scope of the present article.

Troubles

1. *Lack of Definition.* This may be a result either of imperfect focussing or "filling-in" of the lettering. Focusing is facilitated by the use of a magnifier or by removing the film and placing a strip of matted film base in the camera gate. Matte film for focusing is easily made by washing the emulsion from positive film in hot water, and then by rubbing the film on a smooth surface covered with moistened powdered carborundum.

"Filling-in" is a result of over-exposure or the use of too wide a lens aperture.

2. *"In and out of Focus Effect" on the Screen.* This is a result either of insufficient gate tension or buckling

*Animated Cartoons by E. C. Lutz, Scribner's Sons, New York.

of the film caused by too rapid drying of the film. Buckle may be prevented by slow drying and taking care that the film is not subjected to tension during drying. Buckled film may often be restored by re-subjecting it to a humid atmosphere.

3. *Fluctuations of Background Density.* This is caused either by unsteady cranking or fluctuation of intensity of the title card illuminator. Mercury vapor lamps should be allowed to burn from ten to fifteen minutes before commencing work in order to attain maximum intensity. Fluctuations in the line voltage should be carefully guarded against.

4. *Camera Static.* This is often a result of excessive tension or friction in the camera. The relative humidity of the title making room should be not less than 60% to 70%. Obstinate cases may be overcome by allowing the film to remain over night in a humidor though excessive humidification of the film will cause sticking and buckling in the camera.

5. *Unsteadiness on the Screen* is a result either of unsteadiness in the camera mechanism or lack of rigidity of the camera support.

6. *Lettering is not Parallel with Frame Line.* Title card was not level during taking. The best method of insuring parallelism of frame line and lettering is to sight along a horizontal straight edge fitted to the top of the camera. *(The End)*

(Continued from page 4)

A. Thoroughly dry out a quantity of clean paper by heating in an oven and pack loosely in a box fitted with a tight lid. Place the loosely wound film in the center of the dry paper and allow to remain over night. The desiccated paper rapidly absorbs moisture from the film and should be redried daily. On removing from the drying box, repack the film immediately.

B. A more rapid method of drying the film consists in placing the film in a container together with calcium chloride, which rapidly extracts moisture from the surrounding air. Calcium chloride is supplied commercially either in sticks or as porus lumps which pulverize when shaken so that if the chloride were placed in close contact with the film, fine particles of dust might be shaken onto the film, while in time the calcium chloride liquifies and this might also run on to the film. It is better, therefore, to use pumice or asbestos wool impregnated with the calcium chloride so as to prevent possible injury to the film by the pulverized or liquid chemical. Thoroughly soak the broken pumice or asbestos wool in a saturated solution of the calcium chloride and then dry out thoroughly on a shovel or a piece of sheet iron over a fire; place the pumice on the bottom of a wooden box or metal can and support the film over this on a suitable perforated shelf. A convenient drying box is made by soldering together two motion picture film cans back to back and then perforating the base now common to the two cans. The absorbent material may then be placed in one section of the twin can and covered with a little absorbent cotton and the film placed in the adjoining section. When the pumice or asbestos wool loses its desiccating property by becoming moist it may be restored by reheating over the fire, and this process may be repeated indefinitely.

Although in the larger motion picture laboratories it is possible to control the temperature of all developing solutions, many small laboratories have no equipment for cooling so that it is necessary to work with solutions at existing temperatures and wash water as high as 90°F. It is,

SPEED! SPEED! SPEED!

The Bausch & Lomb Ultra Rapid Anastigmat is an f:2.7 lens. This not only is its rated speed, it is the speed at which it actually performs.

Bausch & Lomb Optical Co.

New York San Francisco Washington Chicago
Boston ROCHESTER, N. Y. *London*

CRECO

FOR RENT!
Bell & Howell Cameras
COMPLETE EQUIPMENT
40, 50, 75 M. M. Lenses 170 Shutters
J. R. LOCKWOOD
523 North Orange St.
Phone Glendale 3361-W Glendale, California

Cinema Studios Supply Corp.
1438 Beachwood Drive
Holly 0819
LIGHTING EQUIPMENT FOR RENT
L. A. FIRE DEPARTMENT
Water Engine
WINO MACHINES

therefore, necessary to so harden the film that it will withstand washing at this temperature and not become unduly softened.

Motion picture negative and positive emulsions as they leave the factory melt in water at a temperature around 95°F. At temperatures above 75°F. the emulsion swells and softens to such an extent that it cannot be safely handled on drying reels without danger of scratching; although old film will withstand higher temperatures than films fresh from the factory, because the gelatine emulsion hardens with age. It is, therefore, necessary necessary that film should not be in a swollen condition as it leaves the wash water while it should be sufficiently hardened so that it does not melt during drying. Prevention of swelling of the gelatine is the most important point to observe in high temperature processing. The slow drying of film in hot moist climates is usually a result not only of high humidity, but of excessive quantity of water in the swollen film which has to be evaporated. The swelling of gelatine may be prevented or retarded by the following methods:

A. By the use of concentrated solutions. For example, in a 10% solution of sodium sulphate a gelatine emulsion which normally melts at 95°F. melts at 110°F., and the rate of swelling at any given temperature is retarded in due proportion. Prolonged development of negative film for, say 10 to 15 minutes in a dilute developer, is fatal at temperatures above 80°F. The concentration of the developer should, therefore, be so adjusted that no appreciable swelling occurs.

B. By the addition of inactive salts to the solutions. Instead of increasing the concentration of the developer, salts such as sodium sulphate, sodium phosphate and substances such as glucose and sugar may be added, which both prevent swelling of the gelatine and retard development. Since in many cases 4 or 5 minutes is the most convenient time for development, if a developer otherwise requires three minutes at a given temperature, enough sodium sulphate may be added to retard the development time to 5 minutes. If, on the other hand, it is desirable to shorten the time of development when the neutral salt has been added, the concentration of the developer ingredients should be increased.

C. By permanently hardening the gelatine. When the swelling of gelatine is retarded by the use of a concentrated solution the gelatine is said to be temporarily hardened. If in this unswollen condition it is chemically tanned or hardened by such agents as formaldehyde, chrome alum, or potassium alum, it is said to be permanently hardened and will swell again only very slowly on immersing in hot water. It is obvious that the gelatine should be permanently hardened as early as possible during the development process. It has been proposed to harden the film with formalin both before and during development and Messrs. Ilford Ltd.[3] have patented a mixture of formalin and a salt such as sodium sulphate for hardening the emulsion previous to development. However, it is necessary to wash thoroughly after bathing in the hardener and previous to development. The addition of formalin directly to the developer has also been recommended and gives satisfaction in certain cases, but in many instances it causes fog, while for maximum hardening the quantity of of formalin must be carefully adjusted to the quantity of alkali and sulphite in the developer. The hardening effect of formalin in developers is now under investigation in this Laboratory.

At the outset, the use of formalin was definitely aband-

3. British Patent No 128 337, U. S Patent No 1,424,062

WINFIELD-KERNER
STUDIO
LIGHTING EQUIPMENT

OUR NEW
ROTARY SPOT LIGHT
Is Second to None

Ask for Demonstration

Al. De Bus
"The Heavylite Man"
Los Angeles County Distributor

Winfield-Kerner Products

Factory:
323-27 East 6th Street
Phone VAndike 6211

Hollywood Office:
6725-55 Santa Monica Blvd
Phones GRanit 9601, GRanit 9402

Night Phone GRanit 4864

TITLES ART BACK GROUNDS

H.C. Jacobsmeyer Co.
HOLLY 482

FOR RENT

Two Bell and Howell Cameras, 40, 50, 75 mm. lenses, Thalhemmer iris. Jean Treheol, Jr., 7042 Stilson Street, Palms, Calif. Telephone 761-243.

FOREIGN AND AMERICAN RESEARCH PHOTOGRAPHS
TELEPHONE HE MPSTD 8781

INTERNATIONAL KINEMA RESEARCH CORPORATION

LOU HOWLAND
HOLLYWOOD SECURITY BLDG

oned for deep tank work owing to its objectionable odor and injurious effect on the nasal membrane of the operatives. Of the remaining hardening agents, namely, aluminum and chrome alums, chrome alum produces the greatest degree of tanning, although a solution of chrome alum is comparatively sensitive insofar as a slight change in the acidity may largely affect the hardening properties, while the hardening properties of the solution fall off or decay with time when the solution is contaminated with developer.

The most suitable stage at which to harden the film with chrome alum is immediately after developing and before fixing. If a preliminary bath is given before development the alum must be thoroughly washed out, otherwise a precipitate of chromium hydroxide will form on the film in the developer. Likewise, alums are precipitated on adding to a developer.

A chrome alum fixing bath is not entirely satisfactory because even without use the hardening properties fall off and are destroyed in three or four days at high temperatures, and with use by virtue of the transfer of developer, the rate of falling off of the hardening properties is still more rapid. A chrome alum fixing bath is satisfactory, however, if used for not more than a day or two, but it is, therefore, uneconomical for deep tank work.

Use any good developer which fully develops in from three to four minutes at 85°F. It is very important not to prolong development beyond this period so that the film does not become unduly swollen. If the developer requires a longer time of development, increase the concentration and reduce the time of development in due proportion. For example, if a developer normally requires eight minutes for negative at 85°F. make it twice as strong and it will then develop in approximately four minutes. If the developer tends to give excessive fog at this temperature add a little potassium bromide. If streaked fog is produced, which is caused by aerial oxidation of the developer during examination of the film, add one part in 500,000 of Pinakryptol Green* which will entirely eliminate aerial oxidation fog.

The following developer formula gives results very free from fog with a minimum of swelling. It is especially suitable for use with negative film.

	Metric	*Avoirdupois*
P-aminophenol (Kodelon)	7 grams	3 lbs.
Sodium sulphite (desiccated)	50 "	21 "
Sodium carbonate (desiccated)	50 "	21 "
Water—to make	1 liter	50 gal.

After development rinse the film for not more than two to three seconds in water and immerse for at least three minutes in the following hardening solution:

	Metric	*Avoirdupois*
Potassium chrome alum	30 grams	12 lbs.
Water—to make	1 liter	50 gal.

Agitate the film for 30 to 45 seconds when first immersing in the hardener. This will tend to prevent any possible blisters, streakiness, or chrome alum stains. If the film is not rinsed slightly and agitated as above, the alkali in the developer is apt to precipitate a sludge of chromium hydroxide on the film, especially with a partially exhausted hardening bath, which is difficult to remove. Blisters may tend to form if the film is swollen on immersing in the hardening bath as a result of decomposition of the carbonate in the developer by the chrome alum, which is normally acid, but agitation will tend to prevent the formation of such blisters.

The hardening properties of the above bath depend on

A. The acidity of the bath;

B. The alkalinity of the film;

C. The age of the bath and quantity of developer carried over to it by the film;

D. The time of immersion of the film in the bath.

A plain chrome alum solution is sufficiently acid to neutralize a considerable quantity of alkali carried over from the developer but the film should be rinsed in order to prevent the bath from rapidly becoming alkaline. The addition of acid to the bath is not recommended because this tends to produce blisters. It is necessary, however, that the film should contain a certain quantity of alkali on immersing in the hardening bath in order to secure maximum hardening. As developer is carried over the color of the bath changes slowly from violet-blue by artificial light when freshly mixed to a yellow-green, in which condition it ceases to harden and should be replaced with a fresh bath. A fresh bath will remain violet colored and retain its hardening properties indefinitely, but once a small quantity of developer is added certain chemical reactions occur which gradually destroy the hardening properties, depending upon the quantity of developer added. The hardening bath should never be overworked and a new bath should be prepared as soon as it ceases to harden satisfactorily.

The time of immersion in the hardening bath should never be less than three minutes, which is usually sufficient to give maximum hardening.

Any hardening or non-hardening fixing bath may be used, because on leaving the chrome alum bath the film should be so hardened that the gelatine will not dissolve off in boiling water. Either a 30% solution of hypo with the addition of 2.5% sodium bisulphite or the regular alum-acid fixing bath or chrome alum fixing bath may be used, though a hardening bath is not necessary.

After thoroughly fixing the film for about five minutes, wash for ten to fifteen minutes. If running water is not available immerse in a tank for five minutes and in a second one for another five minutes. A third immersion in clean water will eliminate most of the hypo, though if permanency is required the film should be thoroughly washed at a later date when an abundant supply of cold water is available. The temperature of the wash water for the above treatment should not exceed 85°F.

Film may be successfully washed in sea water providing it is finally given two or three soakings for five minutes in pure water. It is also desirable to rewash the film at a later date in pure water.

If the temperature of the solutions and wash water exceeds 85°F. the following procedure must be followed:

Any concentrated developer which gives good contrast in from two to three minutes at 90°F. may be used, providing 10% of sodium sulphate crystals is added to the developer. This is in the proportion of one pound of sodium sulphate per gallon of developer. It is very important to develop rapidly or the emulsion will soften and swell excessively. After developing, rinse the film in water for one or two seconds only and transfer to the following hardening bath for three minutes.

	Metric	*Avoir.*
Sodium sulphate (crystals)	120 grams	50 lbs.
Potassium chrome alum	30 "	12 "
Water—to make	1 liter	50 gal.

Agitate the film from thirty to forty-five seconds when first immersed in the hardener in order to prevent blisters, development streaks and stains. See precautions under preceding paragraph on hardening solution.

Follow the instructions given above. The temperature of the wash water should not be over 100°F.

In high temperature work it is important that the tem-

*Procurable from H A Metz, New York City

perature of the various solutions should be maintained as nearly constant as possible, that is, the temperature of all the solutions should be equal because if a swollen film is subjected to a sudden change of temperature, for example, if it is removed from a hot solution to a cold one and vice versa, the gelatine film is subjected to strain and a leather-like graininess of more or less coarseness will appear all over the film which effect is known as reticulation. Recent experiments have shown that excessive graininess of film finished in hot weather is a mild form of reticulation. The effect of a sudden change of temperature is at maximum when the film is excessively swollen and a minimum when unswollen and hardened. Several procedures are, therefore, possible, as follows:

A. Maintain the temperature of all solutions equal to that of the wash water.

B. Use a cool developer and warm hardener, fixing bath, and wash water.

C. Use a cool developer and hardener and warm fixing bath and wash water.

All the above give good results though C is the best procedure if cooling is possible. The wash water may be either hot or cold, that is, once the film is tanned in the unswollen condition it will withstand sudden and severe changes of temperature without reticulating.

The usual difficulty encountered when drying film at high temperatures when high humidities usually prevail is a result of excessive swelling of the gelatine which, therefore, contains an excessive quantity of water. If swelling of the film is prevented by the above recommended procedure, drying will be rapid and can be hastened by raising the temperature of the drying air which in turn raises the relative humidity without danger of softening the film emulsion. Rapid changing of the air in contact with the film surface is also of importance.

In the field, a mosquito netting cabinet is necessary to prevent access of insects to the film.

Excessive graininess of the film which is often produced by slow drying at high temperatures of excessively swollen film, does not occur if swelling of the gelatine is prevented as explained above.

Experiments have shown that the wearing qualities of film processed in the above manner are not materially affected as a result of the excessive hardening with chrome alum. If the gelatine coating, however, is excessively swollen at any period and especially before hardening, the structure of the finally dried hardened gelatine is more or less spongy and it has, therefore, much less strength than gelatine which has not been swollen.

Suitable apparatus for handling motion picture films in the field at high temperatures has been described in previous papers[4].

At normal temperatures film undergoes only a very slight change with age—so slow that no alteration of its physicial properties takes place for several years, providing the film is not allowed to become excessively dry. Under certain conditions, however, the film base undergoes actual chemical decomposition, depending on the conditions of processing and storing.

It has been found that small traces of impurities in the gelatine film such as residual chemicals left in the film either as the result of imperfect fixing or the use of an exhausted fixing bath, or as a result of imperfect washing, or thorough washing in impure water, very materially hastens the decomposition. Film which is to be kept for any considerable length of time should, therefore, be thoroughly fixed in two successive fixing baths and thoroughly washed in pure water.

Experience has also shown that even film which has been thoroughly fixed and washed when stored at high temperatures rapidly becomes brittle, the film base undergoes chemical decomposition, and in a few years' time the film image is destroyed by the decomposition products. At normal temperatures the rate of decomposition is negligible, but with rising temperature above 80°F. decomposition takes place at a very rapidly increasing rate. It is very important, therefore, that film should be stored at a temperature not higher than 60 to 70°F., though a temperature around 40 to 50°F. is to be preferred.

4. "A Portable Apparatus for Developing M P Film at High Temperatures, by J I Crabtree B J Phot Aug 1918, *379*. "The Development of M P Film by the Reel and Tank Systems," by J I Crabtree, Trans Soc M P Eng Vol. 16, *163*.

IMPROVEMENTS IN CINEMA LABORATORY APPARATUS

(Continued from page 7)

means of springs so that the film is maintained as nearly flat as possible.

Transparency titles are illuminated by means of a bank of "Cooper-Hewitt" lamps placed behind the frame (F) while reflection titles are illuminated by a bank of lights placed on each side of the title card holder. The apparatus was originally fitted with a bank of nitrogen filled lamps arranged in the form of a square immediately in front of frame (F) but when photographing on positive film the photographic actinic power of such lamps is very much lower than that of mercury vapor lamps so that this method of illumination was abandoned.

When making titles by reflected light, the frame (F) is removed by inscrewing clamps (P^1P^2) and a wooden board to which the cards are pinned is then attached to the aluminum plate by means of thumb screws.

It is apparent from the above that when operating, all adjustments can be made while viewing the title image in the camera gate. In order to insure that the printed matter is paralled with the frame line, it has been found most convenient to sight across a straight edge fitted to the top of the camera. In this way strict parallelism is insured even though the camera itself may not be level.

2. A Continuous Film Viewing Machine

This machine was constructed in order to permit of viewing the continuity of negative and positive film and for cutting out defects at the assembly table. It has been found most useful for examining negative film but for small laboratories it should prove useful for the final examination of positive film without the necessity of examination in the standard projector. In the larger laboratories a continuous projection machine would appear desirable because it would be less liable to injure the perforations at the high projection speed employed in many inspection rooms. It is impossible to project film at three or four times the normal rate of projection in an intermittent projector without producing corner fractures or otherwise injuring the perforations unless the projector mechanism is examined at very frequent intervals. It is important that more care in projection should be taken on the part of laboratories in order to insure that the wearing qualities of the film are not impaired when it leaves the laboratory.

By means of a single sprocket the film is drawn continuously and without intermittency past an aperture plate fitted with a viewing eye-piece and at the point when each picture frame registers with the aperture or gate it is instantaneously illuminated so that an intermittent effect

is secured. The instantaneous flash of light is produced by means of a rotating hollow drum fitted with a horizontal slot at the periphery and a 21-candle power automobile head-light bulb at the center. The hollow drum is so geared with the driving sprocket that for every revolution of the drum the film progresses through four perforations. Two turns of the crank handle per second gives 16 frames per second at the viewing aperture. More or less flicker of course, exists, depending on the rate of cranking, but this is not objectionable and in no way interferes with the usefulness of the machine in following continuity or cutting out defects.

Sufficient working details are given in Figures 3 and 4 to enable the machine to be constructed by any good tool-maker

The actual machine is shown in Figure 5. The film is passed from reel (R-1) over idler (1) under the recessed gate, over driving sprocket (S), over illuminator (L) to the take-up reel (R-2). The telescope is fitted with a three-times magnifier to facilitate viewing. The gate is adjustable for framing but both gate and sprocket are recessed so as to prevent contact with the film. The illuminator (L) serves to facilitate cutting and is operated by footswitch (F) which extinguishes the drum light (B) when (L) is illuminated. For continuous service a motor drive would be preferable.

No originality is claimed for the fundamental principle of this machine which is designed on the lines of an experimental model constructed by Messrs. Newman and Sinclair, London.

3. An Improved Semi-Automatic Sensitometer

In a previous paper by Jones and Crabtree[1] an automatic sensitometer for timing negatives was described and in a later communication[2] details for constructing a simple modification of his instrument were given. This modified instrument is essenially similar to a printer box as employed by the professional photographer for making paper prints. The negative and positive are placed over a graded sensitometer tablet, over which is fitted a pressure platen. Underneath this tablet an illuminator is fitted and so arranged that on pressing the platen the tablet is illuminated, and extinguished when the platen is released. The time of exposure is determined by means of a clock.

Experience with this machine soon indicated that some method of automatically timing the exposure was necessary and of the various methods of accomplishing this, an electrical device was considered the most economical and easy to construct and this was adopted as follows:

The Timing Device

This consists essentially of a means for making and breaking the lamp circuit for definite time intervals and is effected by driving a cam with a constant speed motor, the cam in turn operating a sliding contact.

With such a device it was found necessary to install a method of signalling which would indicate to the operator when to press and when to release the platen and this was effected as follows: Referring to figure 6, the constant speed motor drives two cams attached to a common shaft, one of the cams operating a contact breaker for the exposure lamp circuit while the other cam operates the signal lamp circuit. The signal circuit soon over-laps the exposure lamp cam at both ends so that the signal lamp lights about 1 second before the exposure lamp and remains lighted until the latter is extinguished. In this way the operator is warned not to press the platen while the red signal lamp is illuminated.

The length of the exposure is determined by the angular measurement of the cam and in the instrument described this was adjusted so that a constant exposure of two seconds was given. When matching the timer with the printer the intensity of the sensitometer lamp is adjusted by means of a rheostat and volt meter.

In order to prevent an error on the part of the operator when pressing the platen a signal bell was installed which rings whenever an error is made. The mechanism of this is shown in Figures 7 and 8.

The platen when pressed operates a 3 point switch (Fig. 8). The two lower contact points are in circuit with a set relay which in turn is in circuit with the electric bell. If the platen is pressed or released when the timing device is making contact in the exposing lamp circuit, a current flows and actuates the set relay, causing the bell to ring. Ringing of the bell, therefore, indicates that either (a) the platen was pressed or released at the wrong time or (b) that the pressure on the platen was not sufficient.

The set relay is shown in Figure 7. Whenever the bell rings the relay must be reset by pulling out the "choke" handle (C). The wiring diagram (8) is self-explanatory.

The sensitometer proper is shown in Figures 9 and 11. The sensitometer tablet is inset in the top of the central box which is fitted with a monofilament tubular lamp (L) a signal lamp (S) and a safelight (G) to the left of the tablet, each lamp working independently in a separate compartment. The safelight (G) is for the purpose of registering the frame lines of the negative with those of the tablet. The adjusting pins (A) are to assist in the registration. The volt meter (V) illuminated by lamp (1) indicates the lamp voltage, which in turn is controlled by rheostat (R). The "choke" (C) is for resetting the relay. The authors are indebted to Mr. A. C. Hardy, formerly of this laboratory, for valuable assistance in designing the timing and signalling devices.

4. Safety Devices

Whenever inflammable material such as cellulose nitrate film is handled, great care must be exercised to prevent any possible short circuit in the electrical system while care must also be taken that film does not come into contact with heated radiators, which should be screened, or with electric lamp bulbs. The heat from an ordinary electric bulb is sufficient to ignite a piece of nitrate film which may happen to be in contact with it for a sufficient length of time. Waste film should also be immediately placed in a metal container. With a view to eliminating danger from the above causes the following devices have been adopted:

(A)—A Safe Electrical Plug and Socket

The ordinary screw electrical socket is apt to cause arcing if unscrewed, when the electrical circuit is complete, while if the cable is strained a short circuit is apt to result from crossing of the wires. The ordinary two prong type of plug is not satisfactory because it is not possible to ground a machine with such a plug, although if any strain is placed on the cable the plug usually becomes disconnected, thus eliminating the danger of a short

(Continued on Page 25)

1. A New Sensitometer for the Determination of Exposure in Positive Printing, by L A Jones and J I Crabtree Trans Soc M P Eng 15, 1922 p 89
2. Development of Motion Picture Film by Reel and Tank Systems, by J I Crabtree Trans Soc. M P. Eng 16, 1922 p 163

New Bell & Howell Professional Model Out

Direct Focusing *on* Ground Glass Embodied *in* New Standard Camera.

Features *of* New Model Announced *in* Detail *for the* First Time.

Many rumors which developed in the last several months about the features of the new Standard Bell and Howell camera have now been definitely settled by announcement of the company's plans in last month's issue of the *American Cinematographer* and by the actual receipt in Hollywood territory of the first of this much discussed model.

The model now on display at the Hollywood branch of the Bell and Howell Company is a source of widespread interest. Those who have viewed it point out the fact that the new improvements facilitate the ease of operation of the camera, thus making possible the conservation of valuable time and corresponding dollars.

Direct Focusing

One of the most important features is the new direct focusing arrangement. The focusing is now accomplished by two direct methods from the rear of the camera with the aid of a telescopic magnifier in combination with double right angle prisms. These methods are as follows.

1. Focusing on the film.
2. Focusing direct at the aperture upon a ground glass.

In either method selected it is noted there is no necessity of shifting any part of the camera or swinging the lens out of position or moving any of the front vignetting attachments.

Image Upright

When it is desired to focus on the film a lever is pressed which opens a curtain in the prism, and a direct view of the field is obtained and enlarged with the use of the telescope tube. A single operation, that of pressing the curtain lever, accomplishes the means for direct focusing by this method. The image remains in an upright position.

When it is desired to focus on the ground glass for real hypercritical focusing, a full frame in the film is automatically cut out by pressing a lever on the camera. A press of another lever automatically moves the prism curtain and slides a ground glass into position at the photographic aperture exactly in the focal plane. As in the first method described, the image is upright and with the use of the telescopic magnifier a clear and brilliant field is obtained. The notable feature of this method of focusing is summed up in three sample instantaneous operations performed entirely from outside of the camera, being all that is required to do what previously took eight or nine operations.

Nearer Focal Plane

Another new feature of interest is the removable photographic aperture permitting the insertion of contact matts which are placed nearer the focal plane than has heretofore been possible.

New Finder System

Still another feature is the new finder system which employs a common finder and matts to match the individual photographic lenses. A clear, brilliant and four or five times magnified view is obtained through the use of this feature.

Graduated means are also provided for obtaining the effect of a rising and falling front, so often desirable on settings requiring deletion of certain portions which is readily accomplished now without resetting position of camera.

Fit Present Model

In connection with these new improvements, it is announced that they may be incorporated in the older and present models, thereby eliminating the necessity of investing in an entirely new camera to obtain later improvements. This feature is highly appreciated by Bell and Howell owners since it makes possible deriving the benefits of the new features without discarding the older models.

Mr. G. E. Richards, manager of the Hollywood branch of the Bell and Howell Company, has made arrangements to take care of all those who wish to become acquainted with the working details of the new model. Likewise, the Bell and Howell organization has completed comprehensive plans for the installation of the new features on present Bell and Howell models.

(Continued from Page 24)

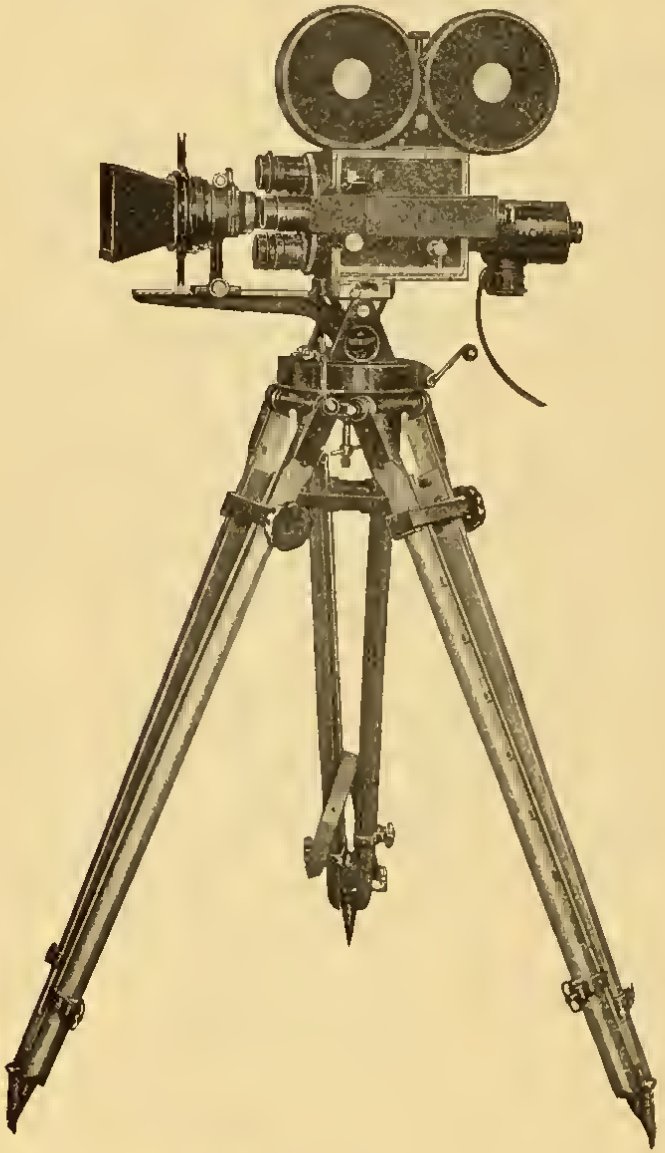
circuit. A satisfactory plug should not arc; it should become disconnected if the cable is strained, and it should be possible to ground a machine through the plug. A plug and socket fulfilling these conditions is shown in Figure 12. It is essentially similar to the ordinary two prong plug excepting that it is of more rugged construction and is fitted with an outside metal collar which fits over a second metal collar surrounding the socket which, in turn, is in connection with the grounded conduit. In this way it is possible to ground a machine through the armored cable which is soldered to the plug.

(B)—An Inspection and Assembling Table

Many laboratory inspection tables are fitted with an illuminator which is set in an aperture in the table top but such an illuminator is dangerous because particles of film are apt to fall on the heated lamp bulb with the possibility of fire, while there is also possibility of fire from short circuiting of lamp wires. A safe inspection table is shown in Figure 13. The table is of steel and is covered with an opal glass or "Vitrolite" top, the reflected light from which is usually sufficient for inspecting film, although extra illumination may be obtained by means of an inclined mirror (M) (Fig. 13) which reflects either daylight or light from the vapor proof enclosed lamp suspended above the table.

Waste scraps of film are swept into the film container attached to the right hand edge of the table. The container is fitted with a door hinged at the upper edge so that it normally remains closed or if the contents take fire, (vent holes are fitted at the side) but opens inwardly on pressure with the hand. The contents are removed by opening a sliding door fitted in the bottom.

Focus Direct on Film or on Ground Glass



with new BELL & HOWELL Standard Camera

Three simple operations performed from the rear of the camera now permit FOCUSING DIRECT at the photographic aperture on a ground glass—

—without shifting any part of the camera;

—without swinging the lens out of position;

—without moving any of the front vignetting attachments.

Or FOCUS DIRECT on the film in one operation.

THE IMAGE REMAINS IN AN UPRIGHT POSITION, and is enlarged 5 or 10 times by means of a telescopic magnifier.

Other new features are: The REMOVABLE APERTURE which permits the sliding in of mattes nearer the focal plane than heretofore possible; and the NEW FINDER system employing a common finder and mattes to match individual photographic lenses.

Cinematographers agree that these new and novel improvements facilitate the ease and art of cinematography.

Directors rejoice in the fact that they will save time—and many dollars—in each set-up.

And owners are happy to know that, in pursuance with customary policies of this company to give their users every benefit with the least possible expense, these new improvements may be built into the present Bell & Howell Camera.

The new camera—the talk of the Industry—is now on display at our Hollywood nad New York offices.

Cameras must be sent to our factory to have new features embodied.

STANDARD BELL & HOWELL COMPANY CINEMACHINERY

ESTABLISHED 1907

BELL & HOWELL CO.

BRANCHES
NEW YORK 220 W 42ND ST
HOLLYWOOD 6324 SANTA MONICA BLVD

1801 LARCHMONT AVE
CHICAGO.

Orders now being accepted at branch offices or direct at Chicago office.

Pioneer and world's largest manufacturers of cinematograph cameras and equipment

HOW TO LOCATE MEMBERS OF THE

American Society of Cinematographers

Phone GRanite 4274

OFFICERS

GAETANO GAUDIO - - - - - - - - - - - - - - - *President*
GILBERT WARRENTON - - - - - - - - - - - - - - *Vice-President*
KARL BROWN - - - - - - - - - - - - - - - - - *Vice-President*
HOMER A. SCOTT - - - - - - - - - - - - - - - *Vice-President*
CHARLES J. VAN ENGER - - - - - - - - - - - - - - - *Treasurer*
VICTOR MILNER - - - - - - - - - - - - - - - - *Secretary*

BOARD OF GOVERNORS

Victor Milner, Philip H. Whitman, James C. Van Trees, Frank B. Good, H. Lyman Broening, Homer A. Scott, Fred Jackman, Charles J. Van Enger, Gaetano Gaudio, Gilbert Warrenton, King D. Gray, Reginald Lyons, Paul P. Perry, John F. Seitz, Karl Brown

Abel, David—with Warner Brothers
Arnold, John—with Metro Goldwyn Mayer Picture Corp
Barnes, George S—with Cosmopolitan
Beckway, Wm —
Benoit, Georges—
Broening, H. Lyman—
Boyle, John W —with Metro Goldwyn Mayer Picture Corp
Brodio, Norbert F —Frank Lloyd Productions, First National, United Studios
Brotherton, Joseph—
Brown, Karl—with James Cruze, Famous Players Lasky
Clark, Dan—with Tom Mix, Fox Studio
Cowling, Herlord T —Travel Pictures, Asia
Cronjager, Henry—with Famous Players-Lasky, New York City
Dean, Ercil M —with Famous Players Lasky, New York City
Duran, Robert S —with Hal Roach Studio
Doied, John—Riga, Latvia
Dubray, Joseph A —
DuPont, E. B —with Warner Bros
DuPont, Max B —Tahiti
Edeson, Arthur—with First National, United Studios
Evans, Perry—
Fildew, Wm —
Fairbeck, Harry A —with Ruz Carlton Pictures, starring Rudolph Valentino
Fisher, Ross G —with A. J. Brown Productions, Russell Studio
Gaudio, Gaetano—with Norma Talmadge, Joseph Schenck Productions, United Studios
Gilks, Alfred—with Famous Players Lasky
Glennon, Bert—with Paul Bern, Famous Players-Lasky
Guod, Frank B —
Granville, Fred L —directing, British International Corporation, London
Gray, King D —
Griffin, Walter L—
Guissart, Rene—
Haller, Ernest—Del Andrews Prod
Heimerl, Alois G —
Jackman, Floyd—with Fred W. Jackman Prods
Jackman, Fred W —directing, Fred W. Jackman Prods, Hal Roach studios
Jennings, J. D —with First National, United Studios
Koenekamp, Hans F —with Larry Semon
Kull, Edward—with Universal
Kurrle, Robert—with Edwin Carewe, United Studios
Landers, Sam—
Lockwood, J. R —
Lundin, Walter—with Harold Lloyd Productions, Hollywood Studios
Lyons, Reginald—with Fox
MacLean, Kenneth G —with 'Ben Hur,' Rome, Italy,
Marshall, Wm —with Carlos Prods.
Meehan, George—with Henry Lehman, Fox
Milner, Victor—with Famous Players-Lasky
Morgan, Ira H —with Cosmopolitan
Norton, Stephen S —with Universal Pictures Corp.
Overbaugh, Roy F —New York City
Palmer, Ernest S —
Perry, Harry—
Perry, Paul P —with Douglas MacLean, E. B. O. Studios
Polito, Sol—with Hunt Stromberg Productions.
Ries, Park J —
Rizard, George—New York City
Roos, Len H —Leigh Spencer Bldg., Vancouver, B. C
Rose, Jackson J —Clarence Brown, Universal
Rosher, Charles—with Mary Pickford, Pickford Fairbanks Studio
Schneiderman, George—with Fox
Scott, Homer A —First National, United Studios
Seitz, John F —with Rex Ingram, Europe
Sharp, Henry—with Thomas H. Ince
Short, Don—
Smith, Steve, Jr —with Vitagraph Studio
Steene, L. Burton—
Stumar, Charles—with Universal
Stumar, John—with Universal
Tolhurst, Louis H —"Secrets of Life" Microscopic Pictures, Principal Pictures Corporation.
Totheroh, Rollie H —with Charlie Chaplin, Chaplin Studio.
Turner, J. Robert—with Fox
Van Buren, Ned—
Van Enger, Charles—with Universal
Van Trees, James C —with First National, New York City
Wilkinson, Gilbert—
Whitman, Philip H —with Famous Players Lasky, New York City.
Wilky, L. Guy—with William de Mille, Famous Players-Lasky.

Edison, Thomas A —Honorary Member.
Webb, Arthur C —Attorney

Meetings of the American Society of Cinematographers are held every Monday evening. On the first and the third Monday of each month the open meeting is held, and on the second and the fourth, the meeting of the Board of Governors

1219 20 21 22 GUARANTY BUILDING
Hollywood Boulevard and Ivar Avenue
HOLLYWOOD, CALIFORNIA

LOYALTY PROGRESS ART

PRINCIPAL PICTURES CORPORATION
7250 SANTA MONICA BOULEVARD
LOS ANGELES CALIF

OFFICE OF THE PRESIDENT

August 6th 1924

Mitchell Camera Company,
6025 Santa Monica Blvd.,
Los Angeles, California.

Gentlemen: Attention Mr. H. F. Boeger!

On location in Arizona where the peculiar atmospheric conditions make motion picture photography an art, camera equipment is one of the most important links in the chain.

Mitchell cameras are now being used by Director Sam Wood in the filming of the Harold Bell Wright story THE MINE WITH THE IRON DOOR in the Arizona desert.

Very truly yours,

PRINCIPAL PICTURES CORPORATION

President.